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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
Federal Communications Commission
Washington, D. C. 20554

In the Matter of

Revision of 47 CFR 73.208
Reference Points and Distance
Computations

MM Docket 93-226

COMMENTS

The firm of Hatfield & Dawson Consulting Engineers, Inc. presents comment on the Commission's proposal:

The distance between any two points on the earth's surface is, to a first approximation which ignores geologic events, a constant.

Because the earth is not a perfect sphere the computation of the distance between any two locations is not a trivial matter. If the locations of the points are known, however, the distance between them can be accurately computed to a precision that is intrinsically related to the accuracy of the location method. The calculation of locations and the distances among them has been improved by modern geodesic methods and apparatus, to the point that the nearly universal availability of computer resources and radio-location devices has made accurate calculation of locations and distances an easily managed problem.

The proposed change in the rules has evidently been brought about as a result of the *Nagabo Broadcasting Company* case cited in the NPRM. The Commission may, however, be ill-advised to adopt the rule as proposed without taking into account the errors and assumptions inherent in the existing location records used for licensing.

The Commission has employed a variety of methods for distance computation in various services it regulates at various times. (See NPRM in CC Docket 92-115, p. 10 Appendix A, for a one paragraph example.) Further, although the Commission has generally required FM station antenna coordinates to be specified to the nearest second, the original genesis of the "1 kilometer round-off" is in the provision from Docket 14185 that antenna locations be specified so that spacing could be determined to the nearest mile. (See First Report & Order Docket 14185, 40FCC660 at proposed §3.208(b)(5) page 706.)

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U.S.G.S. quadrangle maps are nearly always used for the determination of site coordinates. Although the "ideal" accuracy of these maps should allow calculation of locations to about the nearest 2 or 3 seconds, the actual map typography practices may cause objects to be shown at variance from their actual locations by at least twice this amount. Further, in the western U.S., many site locations are still based on coordinates calculated from 15 minute or even occasionally 30 minute and 1:250,000 scale maps. Coordinates determined from these sources are not uncommonly in question (if not in error) by as much as 5 or 10 seconds for 15 minute map calculations and 30 seconds for the larger scale maps. Thus the Commission's specification of 1 second precision has never been defensible. Given this circumstance, it is totally preposterous for the Commission to base a rule on distance calculations that are more precise (by from 2 or 3 times to as much as an order of magnitude) than the underlying data used in their computation.

These two practices, the use of different distance computation methods in various services regulated by the Commission at various times, and the folly of using a 1 second precision requirement in a circumstance where the underlying accuracy of the computation is at least twice as large in the best of circumstances, clearly require the Commission to go far beyond its present muddled methodology if there is (as indeed there may not be) a measure of administrative responsibility and efficiency in adopting the proposed rule.

There appears to be, however, a sensible solution to this state of affairs. We have been advised by various Federal agencies, including members of the Commission's OET staff, that the use of the WGS84 datum, together with calculation methodology developed by NGS, would allow consistent determination of distances to the nearest meter. As the use of GPS based navigation systems for aircraft and other navigation becomes common, it will be prudent, and in some cases necessary, for communications tower facilities to be specified to a known accuracy, which will result in corrected, more accurate locations for most of them.

It can be argued, and probably will be, that it doesn't matter if the "real" location of sites is known to the degree of accuracy implied in the proposed rulemaking, since it is merely an administrative matter, and the entire corpus of regulation has traditionally been based on putative locations known to variable degrees of precision, and that the present calculation methodology is entirely adequate for the Commission's administrative purposes. This is not, in the long run, a sensible or even practical view. The use of precision location devices (differential GPS being only the most convenient, not necessarily the only or even the most accurate), and the use of a datum which provides the ability to compute accurately between any two or more locations, regardless of distance or continent, will overtake the Commission's limited requirements within a very short time. The use of precision location for aeronautics is only the most obvious example of non-communications requirements for accurate location of communications facilities.

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There is a further matter requiring attention with respect to this proposed rulemaking. There is currently pending before the commission a Petition for Rulemaking to revise the requirements for second and third adjacent channel short-spacing for pre-1983 short-spacings to the former rules, which do not involve a requirement for precise distance calculations. Resolution of this proposal should not be considered without resolution of the matters raised in the Petition for Rulemaking.

October 15, 1993

Hatfield & Dawson Consulting Engineers, Inc.



by Benj. F. Dawson III, P.E.
President